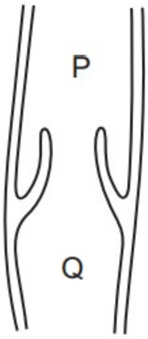
Choice

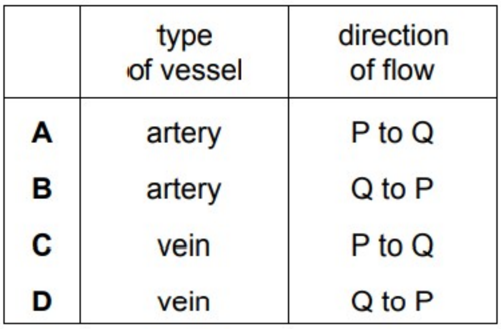
2020/M/22/19 Mammals have a double circulation. Which shows the correct sequence for the movement of blood in a mammal?

A body → heart → lungs → heart
B body → lungs → body → heart
C heart → lungs → body → heart
D heart → body → lungs → heart

2020/M/22/20 The diagram shows a section through a blood vessel.



C.Which type of blood vessel is shown, and in which direction does the blood flow?

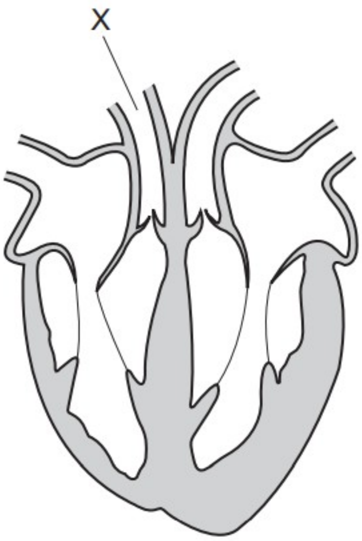


	type of vessel	direction of flow
A	artery	P to Q
B	artery	Q to P
C	vein	P to Q
D	vein	Q to P

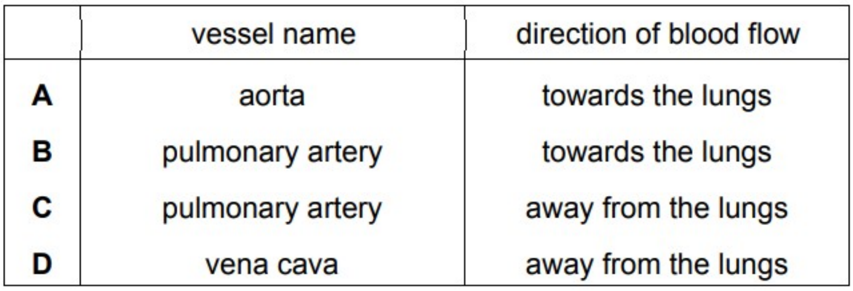
2020/S/21/17 Which pathway is taken by blood in a fish?

A gills → heart → body → gills
B body → gills → heart → body
C heart → gills → body → heart
D heart → body → gills → body

2020/S/21/18 The diagram shows a section through the heart and its blood vessels.

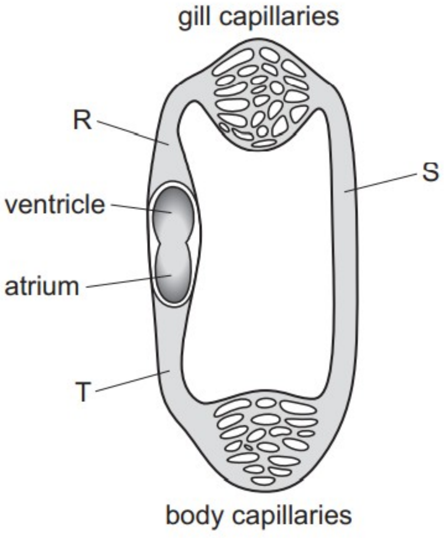


B.Which row gives the vessel name and the direction of blood flow in vessel X?

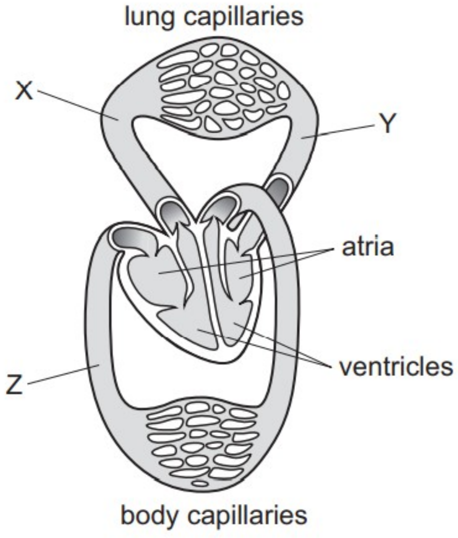


	vessel name	direction of blood flow
A	aorta	towards the lungs
B	pulmonary artery	towards the lungs
C	pulmonary artery	away from the lungs
D	vena cava	away from the lungs

2020/S/22/17 The diagrams show the single circulation of a fish and the double circulation of a mammal.



fish circulation

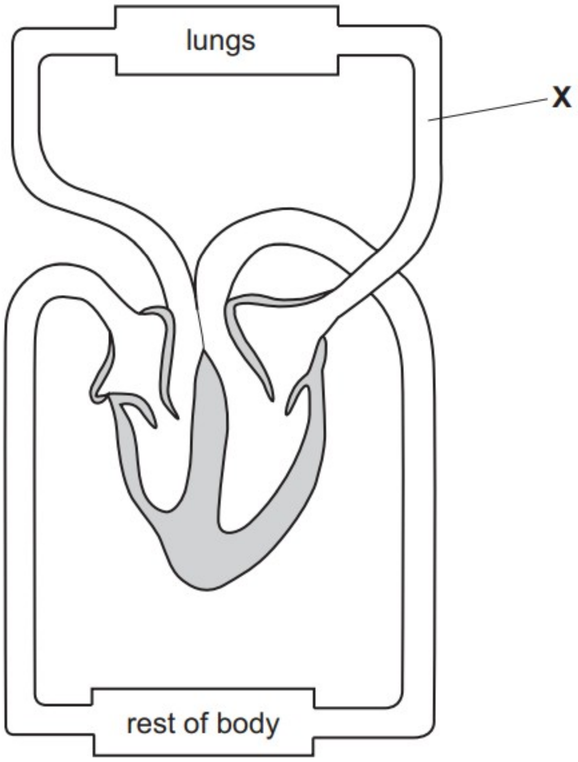


mammal circulation

Which letters represent areas of oxygenated blood?

A R and X B S and Y **C** T and Y D T and Z

2020/S/22/18 The diagram shows the human heart and main blood vessels.



What is the blood vessel labelled X?

A aorta
B pulmonary artery
C pulmonary vein
D vena cava

D.2020/W/21/17 The table shows some features of blood vessels. Which row shows the features of a vein?

	direction of blood flow	size of the central hole (lumen)	thickness of wall
A	away from the heart	large	thick
B	away from the heart	small	thick
C	towards heart	small	thin
D	towards heart	large	thin

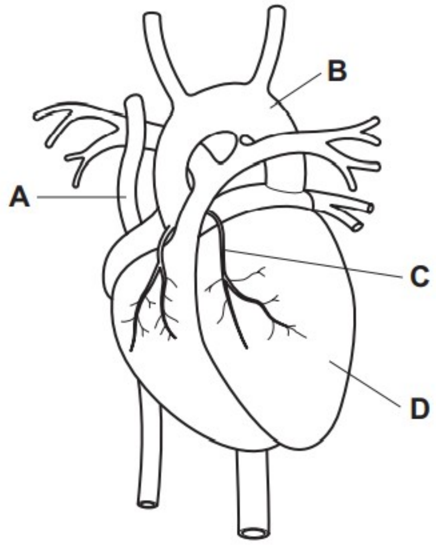
2020/W/21/18 Where are valves found that prevent blood from flowing in the wrong direction?

A capillaries and arteries

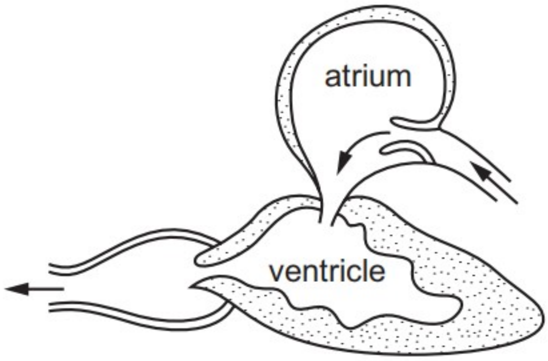
B lungs and veins
C heart and capillaries
D heart and veins

2020/W/22/17 What ensures that blood flows in one direction in the human circulatory system?
A diffusion of carbon dioxide
B diffusion of oxygen
C thick walled arteries
D valves

C.2020/□/01/20 The diagram shows a human heart and some of its major blood vessels. Blockage of which labelled part is a cause of coronary heart disease?



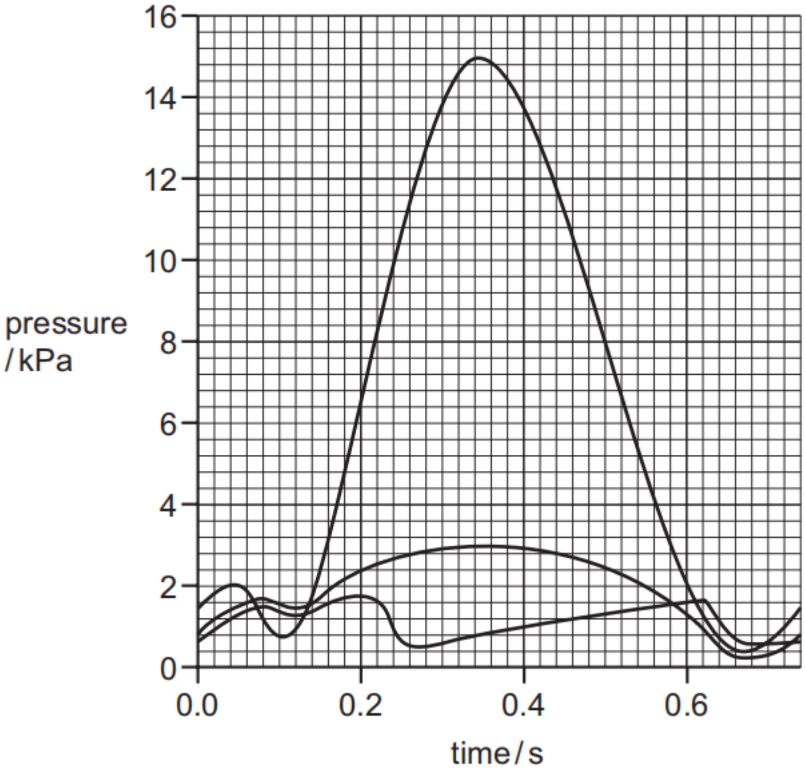
2019/M/22/18 The diagram shows a section through a fish heart and the direction of blood flow.



After leaving the heart, where will the blood flow to next?
A eyes
B fins

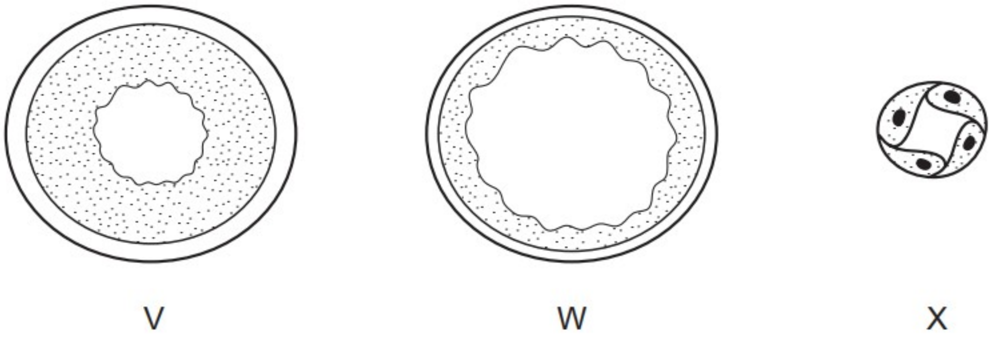
C gills
D tail muscle

2019/M/22/19 The graph shows pressure changes that take place in the right atrium, right ventricle and left ventricle of a human heart when the muscle walls contract and relax.



What is the pressure in the right ventricle when the left ventricle is at its maximum pressure?
A 0.4 kPa
B 2.0 kPa
C 3.0 kPa
D 15.0 kPa

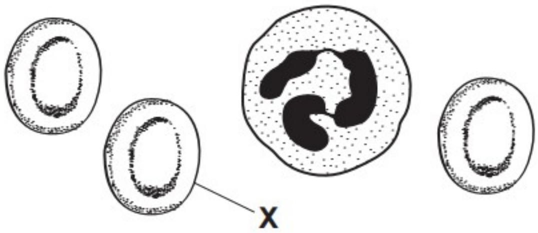
C.2019/S/21/19 The diagram shows cross-sections through three types of blood vessel, not drawn to the same scale.



Which section is from a vein and which is from a capillary?

	vein	capillary
A	V	W
B	W	V
C	W	X
D	X	W

2019/W/21/17 The diagram shows human blood cells, as seen under a microscope.



What is the function of cell X?
A to carry glucose
B to carry oxygen
C to defend against disease
D to make the blood clot

2019/W/22/17 Which factor increases the risk of developing coronary heart disease?
A low fat diet
B regular exercise
C relaxation
D smoking

B.2019/W/23/17 The table shows the concentration of red blood cells, white blood cells and platelets in the blood of four patients.
Which patient is most likely to have a deficiency of iron in their diet and will find it difficult to form a blood clot?

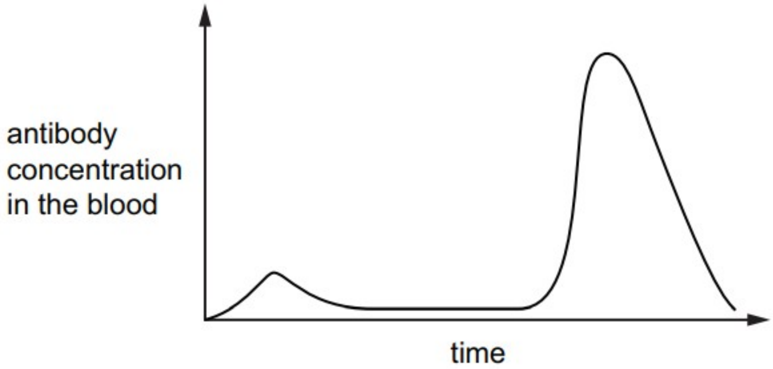
	red blood cells / cells per mm^3	white blood cells / cells per mm^3	platelets / cells per mm^3
A	2525000	643	296000
B	2275000	756	27500
C	7250000	650	275000
D	7325000	405	25000

2018/M/22/14 What is an advantage of a double circulatory system in mammals?
A Blood can flow down the body on the left and up the body on the right.
B Blood can flow more slowly along the circulatory system.
C Blood pressure stays the same throughout the circulatory system.
D Oxygenated and deoxygenated blood are kept separate.

D.2018/S/21/18 During the process of blood clotting, damage to blood vessels stimulates L, and M is converted to N.
What are L, M and N?

	L	M	N
A	fibrin	platelets	fibrinogen
B	fibrinogen	platelets	fibrin
C	platelets	fibrin	fibrinogen
D	platelets	fibrinogen	fibrin

2018/S/21/19 A child is vaccinated against measles. After a period of time the child is infected with the measles virus.
The graph shows the concentration of measles antibodies in the child’s bloodstream during this
time.



Which statement is consistent with the information in the graph?
A After the vaccination, the child produced memory cells.
B The child had passive immunity against measles.
C The measles virus contains antibodies.
D The vaccination failed to protect the child against measles.

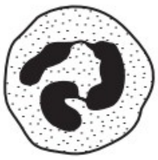
2018/S/22/22 The composition of the blood in the renal vein is different to the composition of the blood in the renal artery.
What substance has a higher concentration in the renal vein than in

the renal artery?
A carbon dioxide
B glucose
C oxygen
D urea

2017/M/22/15 Which is a function of the lymphatic system?
A deamination of **amino acids** □□□□□□□□□
B production of lipase
C protection from infection
D transport of oxygen

2017/M/22/16 A hospital patient who is feeling unwell is given a blood test.
The results of the blood test show a very low level of platelets.
What effect will this have?
A The blood will be unable to transport nutrients, hormones and carbon dioxide.
B The blood will not be able to carry as much oxygen to the tissues as normal.
C There will be a greater risk of bleeding because the blood will take longer to clot.
D There will be a greater risk of infection because the blood cannot make antibodies.

2017/S/21/18 The diagram shows a human blood cell.



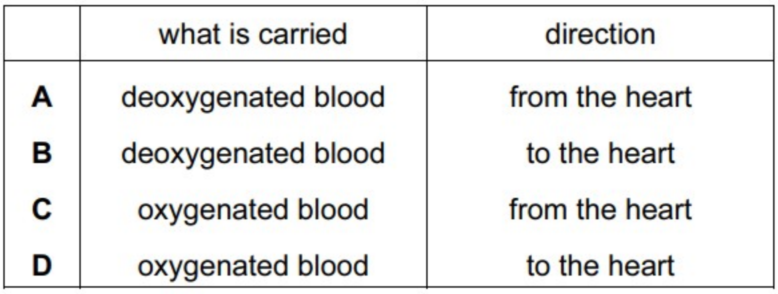
What is its function?
A antibody production
B fibrinogen production
C oxygen transport
D phagocytosis

2017/S/22/19 Which chamber of the heart has the most muscular wall?
A left atrium
B left ventricle
C right atrium
D right ventricle

2017/S/22/20 A deficiency in which of the following may result in a person’s blood failing to clot properly?
A antibodies
B fibrinogen
C haemoglobin
D protease

2017/S/22/21 Which is a function of some white blood cells?
A to carry glucose
B to carry oxygen
C to produce antibiotics
D to produce antibodies

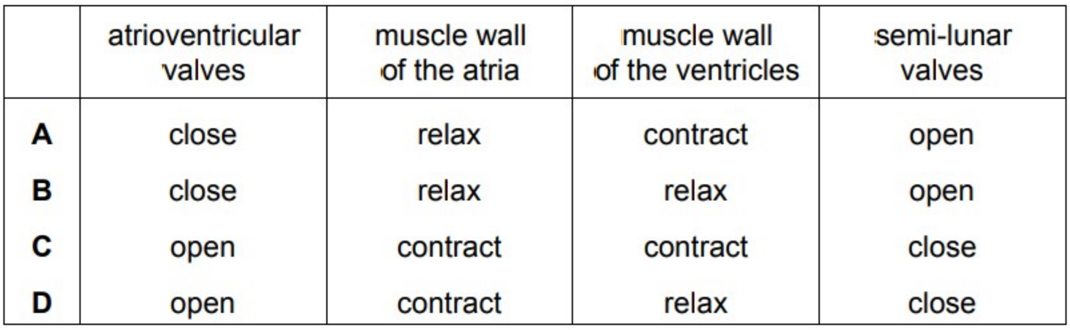
D.2017/S/23/17 Which row shows what is carried, and in which direction, by the pulmonary vein?



	what is carried	direction
A	deoxygenated blood	from the heart
B	deoxygenated blood	to the heart
C	oxygenated blood	from the heart
D	oxygenated blood	to the heart

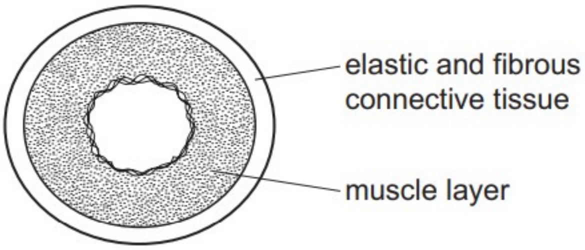
2017/S/23/18 Which component of the blood produces antibodies?
A lymphocytes
B phagocytes
C plasma
D red blood cells

D.2017/W/22/17 What happens as the blood flows from the atria into the ventricles of the heart?



	atrioventricular valves	muscle wall of the atria	muscle wall of the ventricles	semi-lunar valves
A	close	relax	contract	open
B	close	relax	relax	open
C	open	contract	contract	close
D	open	contract	relax	close

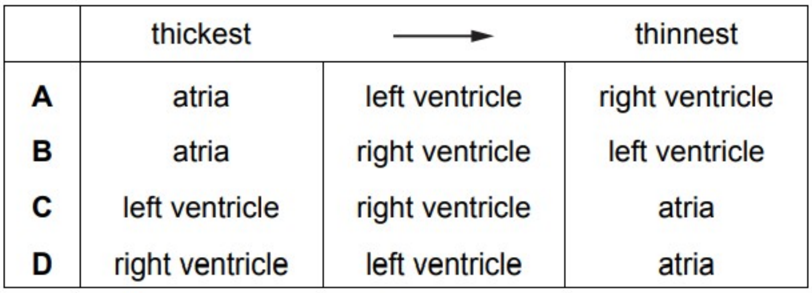
2017/W/22/18 The diagram shows a cross-section through a human blood vessel.



Which type of blood vessel does the diagram show?

A an artery
B a capillary
C a vein
D a ventricle

C.2016/M/22/19 Which row shows the chambers of the heart, from those with the thickest walls to those with the thinnest walls?



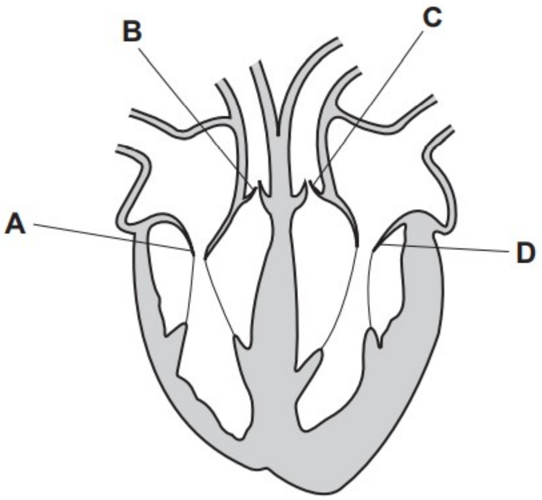
	thickest	→	thinnest
A	atria	left ventricle	right ventricle
B	atria	right ventricle	left ventricle
C	left ventricle	right ventricle	atria
D	right ventricle	left ventricle	atria

2016/S/21/19 What is the function of lymphocytes in the blood?

A antibody production
B blood clotting
C phagocytosis
D transport of hormones

A.2016/S/22/15 The diagram shows a section through the human heart.

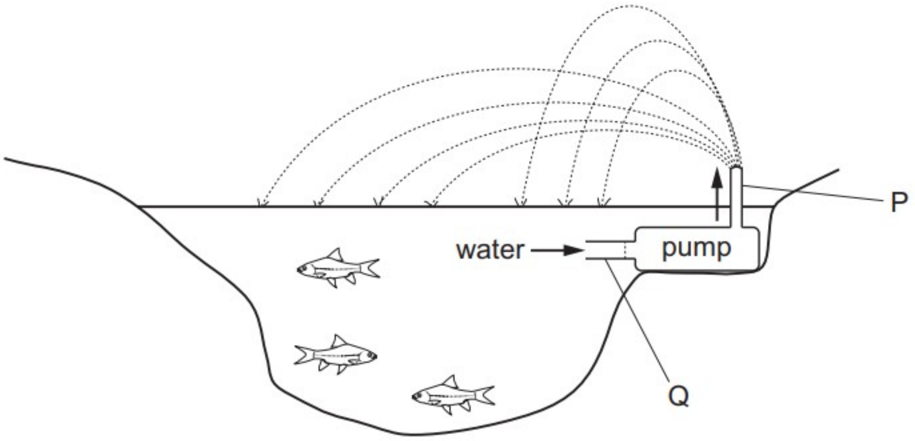
Which is the right atrioventricular valve?



2016/S/22/16 What is the fluid in the blood called?
A lymph
B mucus
C plasma
D tissue fluid

2016/S/23/18 What is a method of reducing the risk of coronary heart disease?
A angioplasty
B ‘by-pass’ surgery
C controlled exercise
D inserting a stent

B.2016/W/21/18 The diagram shows a garden pond with a fountain worked by a pump. The fountain brings oxygen from the air to fish in the pond.



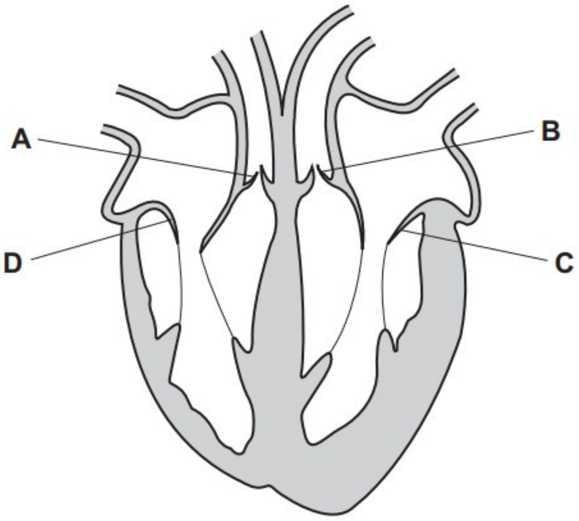
The system can be compared with part of the human circulatory system. The pump is compared with the heart.
What are P and Q compared with?

	P	Q
A	aorta	pulmonary artery
B	pulmonary artery	vena cava
C	pulmonary vein	vena cava
D	vena cava	aorta

B.2016/W/21/19 What happens when the left ventricle contracts?

	atrioventricular valves	semilunar valves
A	closed	closed
B	closed	open
C	open	closed
D	open	open

D.2016/W/22/18 The diagram shows a section through the heart.
Which is an atrioventricular valve in the right side of the heart?



2016/W/22/19 What is a correct function of the lymphatic system?
A protects body from heat loss
B protects body from infection
C transports blood to lymph nodes
D transports urea to the kidneys

2016/W/22/21 Which change occurs during blood clotting?
A fibrinogen to fibrin

B glucose to glycogen
C haemoglobin to oxyhaemoglobin
D maltose to glucose

Theory

2020/m/42/2 (a) Fig. 2.1 shows the transfer of materials between blood and tissues.

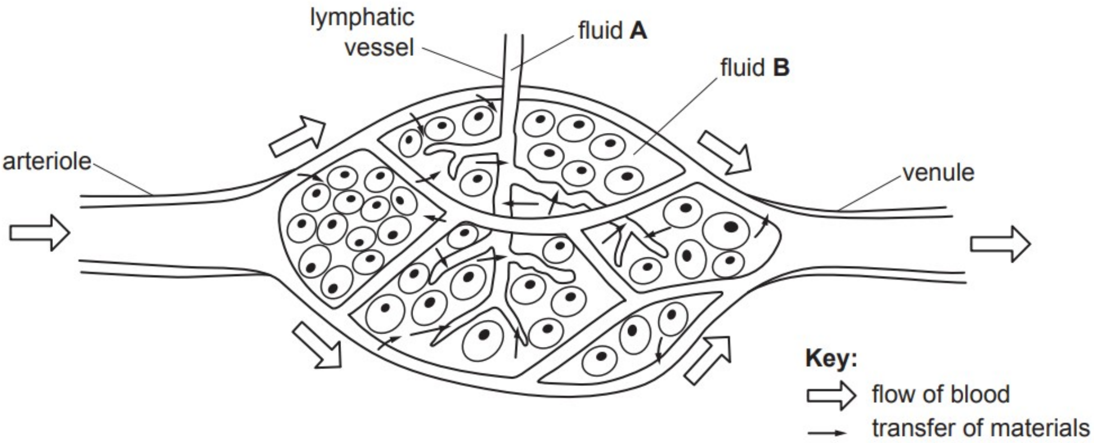


Fig. 2.1

(i) Complete Table 2.1 by:

- stating the names of the fluids
- writing yes if the fluid contains red blood cells or no if the fluid does not contain red blood cells.

Table 2.1

letter on Fig. 2.1	name of the fluid	contains red blood cells
A		
B		

(ii) State the name of the process by which oxygen is transferred from fluid B to the cells.

....

[1]

(iii) Explain why cells need oxygen.

....
....
....

[2]

(b) Describe the functions of arterioles in the skin.

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....
....

[3]

(c) Describe the functions of lymph nodes in the lymphatic system.

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....
....

[2]

(d) Lacteals are part of the lymphatic system.

(i) State where in the body lacteals are found.

....

[1]

(ii) Describe the role of lacteals.

....
....

[1]

2016/S/42/1 All mammals have a double circulatory system. Fig. 1.1 shows part of the human double circulatory system.

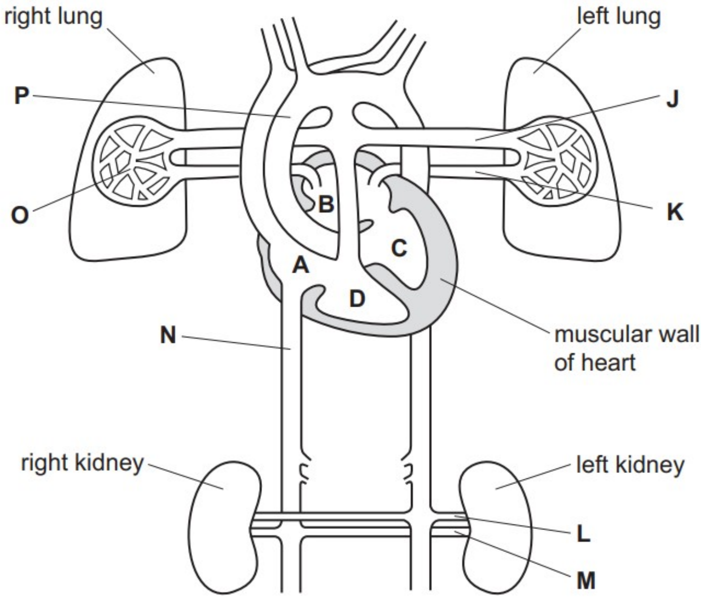

Fig. 1.1

(a) Name the muscular wall that separates the left and right sides of the human heart.

....
.... [1]

(b) (i) Describe what is meant by the term double circulation.

....
....

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....
.... [1]

(ii) State one advantage of a double circulation.

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....

....
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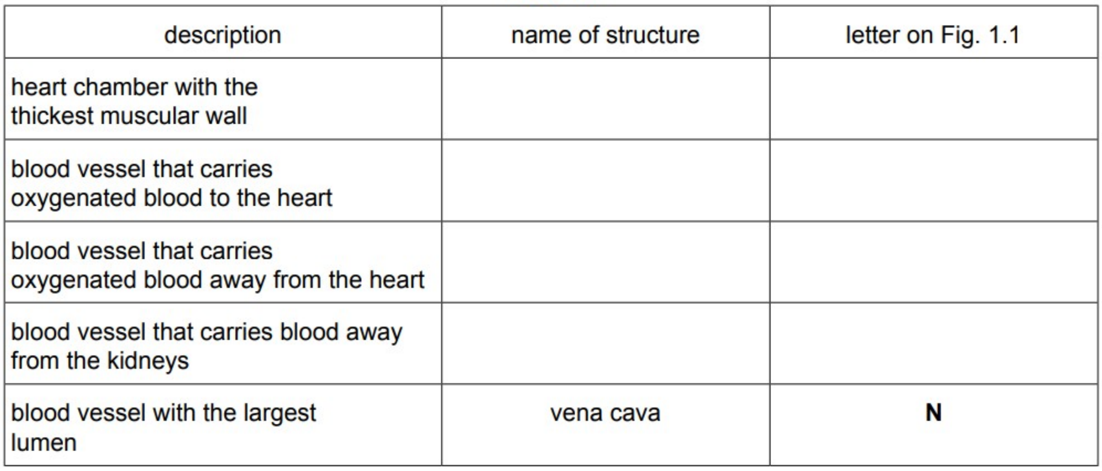
....
.... [1]

(c) Table 1.1 describes some of the structures of the human circulatory system shown in Fig.1.1.

Complete the table.

One row has been done for you.

Table 1.1



description	name of structure	letter on Fig. 1.1
heart chamber with the thickest muscular wall		
blood vessel that carries oxygenated blood to the heart		
blood vessel that carries oxygenated blood away from the heart		
blood vessel that carries blood away from the kidneys		
blood vessel with the largest lumen	vena cava	**N**

[4]

(d) Describe how blood is transported from the vena cava to the lungs. You may use the letters
on Fig. 1.1 in your description.

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.... [4]

(e) (i) Doctors recommend that a healthy diet can reduce the risk of coronary heart disease.
Give one other lifestyle improvement patients can make that can reduce the risk of
coronary heart disease.

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....

....
.... [1]

(ii) Sometimes surgery is required to treat coronary heart disease.
Describe one named example of surgery that can treat coronary heart disease.

....
....

....
....

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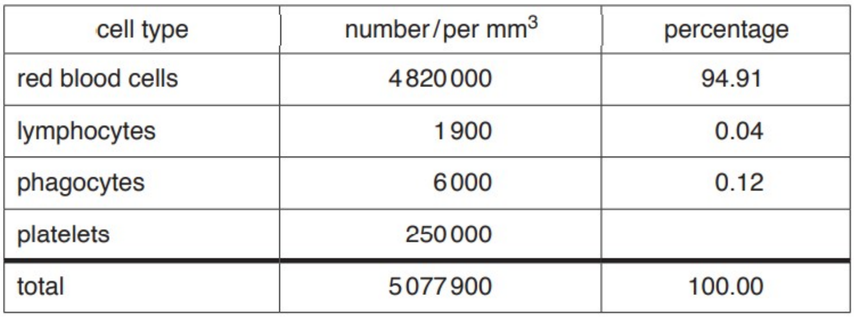
....

....
....

....
.... [2]

2016/W/42/5 The numbers of different cells in a blood sample were counted. The results are shown in Table 5.1.

Table 5.1



cell type	number / per mm^3	percentage
red blood cells	4820000	94.91
lymphocytes	1900	0.04
phagocytes	6000	0.12
platelets	250000	
total	5077900	100.00

(a) Complete the table by calculating the percentage of platelets. Write your

answer in Table 5.1
to two decimal places. [1]

(b) State the role of platelets in the blood and describe the process they are involved in.

....

....

....

....

....

.... [4]

2018/W/42/5 Fig. 5.1 shows a photomicrograph of human blood.

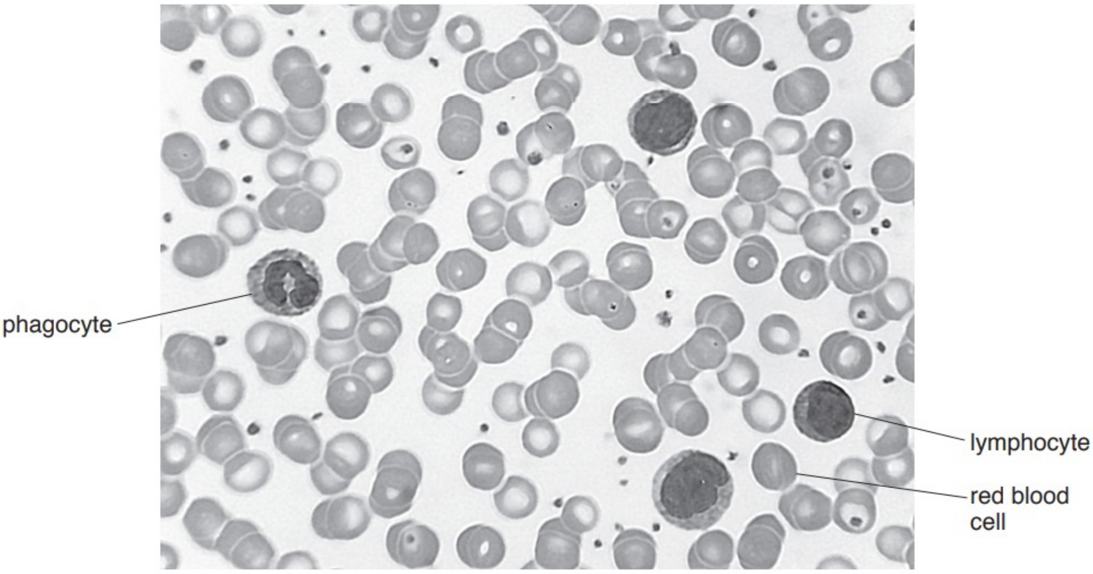


Fig. 5.1

(a) Describe the differences in appearance and the roles of the three cells labelled in Fig. 5.1.

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.... [6]

(b) Fig. 5.2 shows some of the stages of blood clotting.

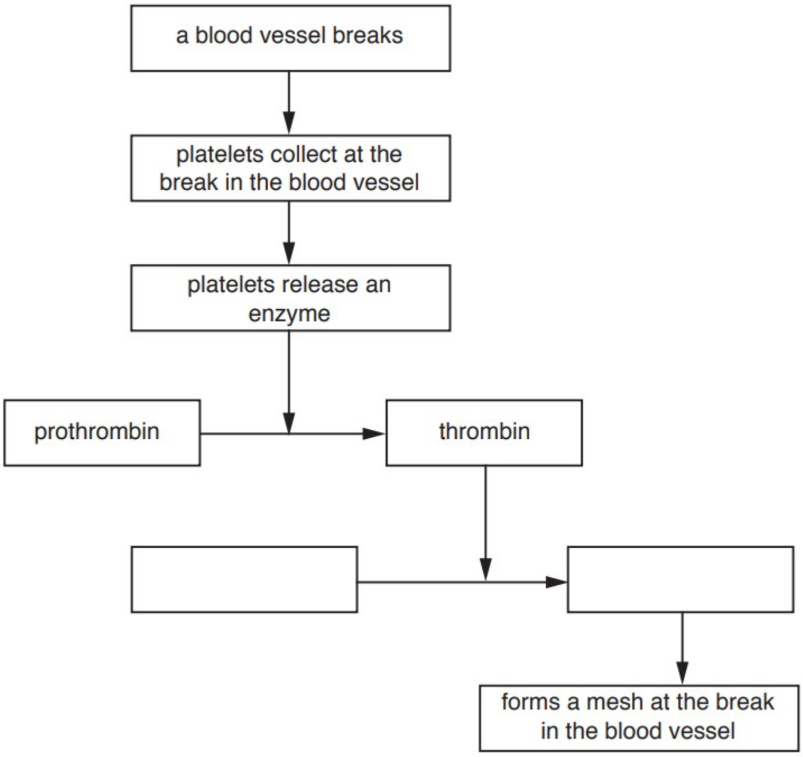
a blood vessel breaks
platelets collect at the break in the blood vessel
platelets release an enzyme
prothrombin
thrombin
forms a mesh at the break in the blood vessel

Fig. 5.2

(i) Complete Fig. 5.2 by filling in the two empty boxes. [1]

(ii) State two roles of blood clotting.

....

....

....

....

.... [2]

2018/W/43/6 Fig. 6.1 is a diagram showing some body cells and parts of the human lymphatic and circulatory systems.

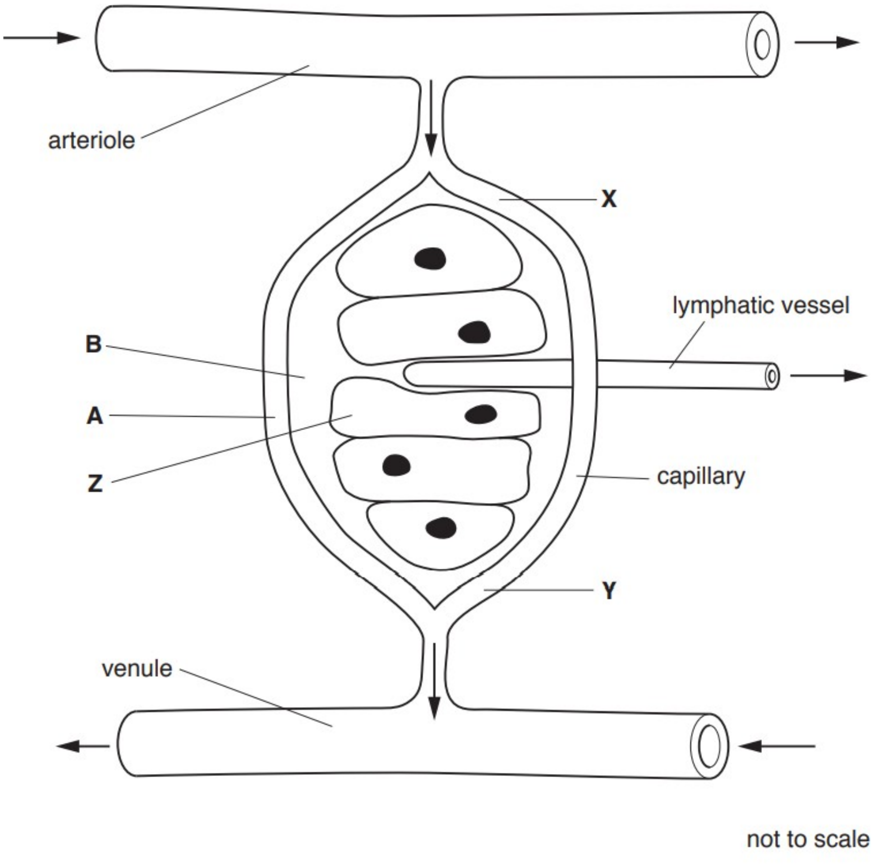

Fig. 6.1

(a) Capillaries allow blood to reach most cells in the body.

(i) State the name of the process by which oxygen moves from A to Z as shown in Fig. 6.1.

....[1]

(ii) Describe how some of the liquid in A moves to B in Fig. 6.1.

....

....

....[2]

(iii) State one component of blood that remains inside the capillaries as the blood flows from
X to Y in Fig. 6.1.

....[1]

(b) Lymphatic vessels are similar in structure to veins.

(i) Describe the structure of veins.

....

....

....

....

....[2]

(ii) Describe the role of the lymphatic vessel shown in Fig. 6.1.

....

....

....

....

....[2]

(c) Lacteals are another part of the lymphatic system.

State where in the body lacteals are found and state their function.

location in the body ....

function ....

....

[2]

(d) In the lymphatic system, there are structures that contain large numbers of lymphocytes.

(i) State the name of these structures.

....[1]

(ii) State the role of lymphocytes.

....

....

....[2]

[Total: 13]

2017/M/42/1 Fig. 1.1 shows a vertical section through a human heart and the major blood vessels.

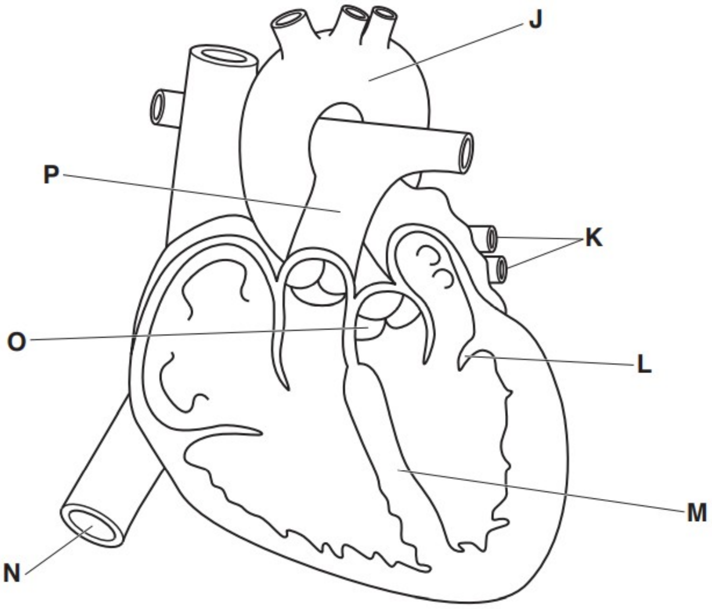

Fig. 1.1

(a) (i) State the names of the structures labelled L, M and O as shown in Fig. 1.1.

L ....

M ....

O ....

[3]

(ii) Identify a letter on Fig. 1.1 that represents a blood vessel that has:

blood with the highest concentration of carbon dioxide ....
blood with the highest concentration of oxygen ....
the highest pressure ....

[3]

(b) (i) Describe how blood is moved by the heart from blood vessel K to blood vessel J.

....

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....[5]

(ii) Explain why the wall of the left ventricle is thicker than the wall of the right ventricle.

....

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....

....

....[2]

[Total: 13]

2017/S/41/4 Fig. 4.1 shows part of the circulatory system of a fish.
The arrows show the direction of blood flow.

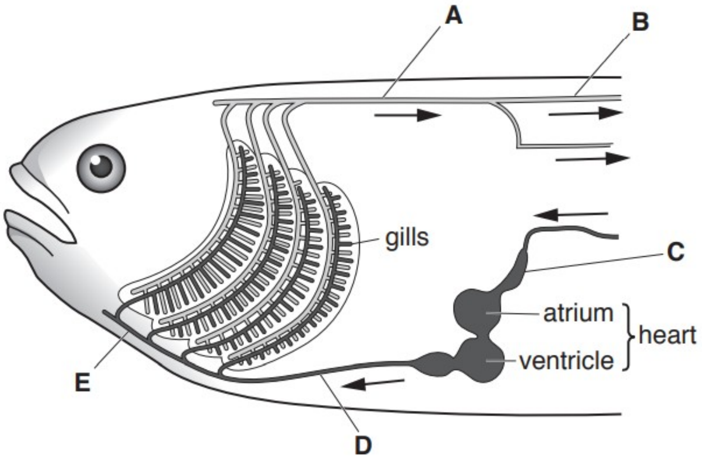

Fig. 4.1

(a) The circulatory system of fish is described as a single circulation.
State what is meant by a single circulation.

....

....[1]

(b) State the letter of the blood vessel in Fig. 4.1 that contains blood at the highest pressure.

.... [1]

(c) The gills are the site of gas exchange.
State two features of gas exchange surfaces.

1 ....

....

2 ....

....

[2]

[Total: 4]

2017/S/43/1 Fig. 1.1 is a diagram of the human heart. The diagram shows the phase during the heart beat
when the atria contract. The blood vessels that carry blood to and from the heart are labelled

A to F.

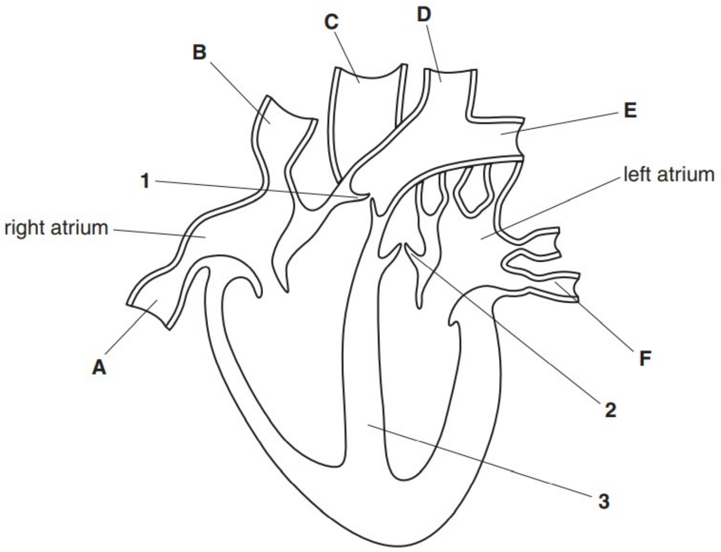

Fig. 1.1

(a) (i) Draw one arrow on Fig. 1.1 to show the pathway taken by blood from a vein into the
right ventricle. [1]
(ii) Identify the letter of the blood vessel that carries blood at the highest pressure and state
its name.
letter ....
name of the blood vessel ....
[1]
(b) (i) Suggest what causes the valves at 1 and 2 to close during a heart beat.
....
............[1]
(ii) State the function of valves 1 and 2 in the heart.
....
............[1]
(c) Fig. 1.1 shows the phase of the heartbeat when the ventricles are filling with blood.
Using Fig. 1.1, describe and explain how the blood travels from the right ventricle to the
lungs.
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....................[4]

(d) State the name of the part of the heart labelled 3 and state its role in the mammalian
circulation.

name ....
....

role ....
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....

[2]

[Total: 10]

2017/W/42/6 Glucose is absorbed into the blood in the small intestine. Fig. 6.1 shows the human circulatory system and the pathway taken by molecules, such as glucose, when they travel in the blood.

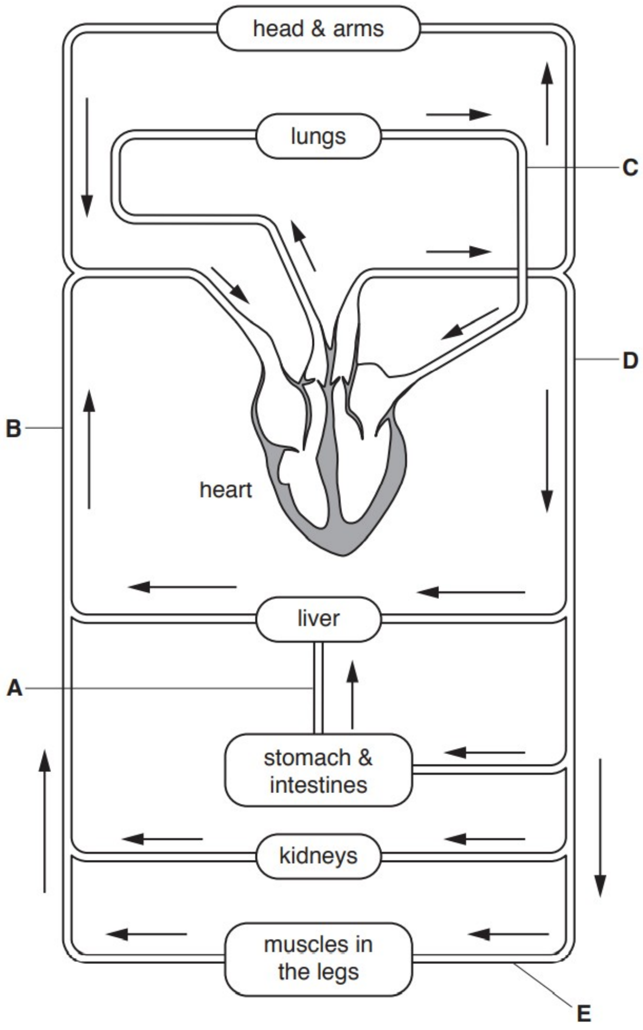

Fig. 6.1

(a) Complete Table 6.1 by naming the blood vessels labelled on Fig. 6.1 and stating whether
they contain oxygenated blood or deoxygenated blood. One row has been completed for you.

Table 6.1

letter on Fig. 6.1	name of the blood vessel	oxygenated or deoxygenated blood
A		
B		
C		
D		
E	femoral artery	oxygenated

2017/W/42/6(b) Insulin is a hormone that is secreted by the pancreas.

(i) Define the term hormone.

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....[2]

(ii) Describe the role of insulin in the body.

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....[3]

(c) Explain how blood flow in the skin helps to maintain a constant body temperature in very hot
conditions.

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[Total: 12]

2017/W/43/2 A group of students investigated the effect of exercise on their heart rates.

They measured their heart rates:

- before exercise
- immediately after running 1km
- one minute after running 1km

Before doing the investigation they wrote a hypothesis.

(a) (i) Write a hypothesis for this investigation.

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(ii) The students measured their pulse as an indicator of heart rate.

Describe how the students could measure their pulse.

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...........[2]

(b) In another investigation, a doctor tested some of her patients to determine the effect of
exercise on coronary heart disease.

Coronary heart disease is caused by a blockage in the coronary artery.

Describe the effect on the heart of a blockage in the coronary artery.

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...................[2]

(c) The doctor divided her coronary heart disease patients randomly into two equal groups.

Each group was given different instructions:

- group A – patients were given a daily exercise plan
- group B – patients were told to make their own exercise plan.

The doctor measured the heart rate (HR) of each patient immediately after doing exercise
and again one minute later.

She calculated their heart rate recovery using this formula:

heart rate recovery = HR immediately after exercise – HR one minute after exercise.

She then calculated the average heart rate recovery for each of the two groups of patients.

The doctor repeated these measurements after three months and after six months.

The results are shown in Fig. 2.1.

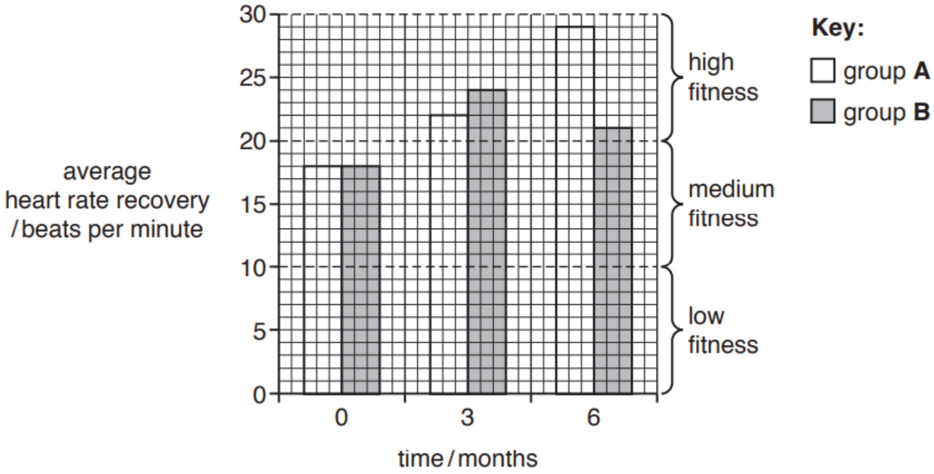

Fig. 2.1

Describe and explain the effect of exercise on the average heart rate recovery of the coronary
heart disease patients in group A and group B.

Use data from Fig. 2.1 to support your answer.

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(d) Exercise may reduce the risk of coronary heart disease.

State one other possible way of reducing the risk of developing coronary heart disease.

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...................[1]

[Total: 13]